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ORIGINAL RESEARCH

Pigmented nevus of the external auditory canal

Fei-Peng Lee, MD, Taipei, Taiwan

OBJECTIVE: To present the clinical experience during an 18-year period of a series of 11 cases of pigmented nevus of the external auditory canal (EAC).

STUDY DESIGN AND SETTING: Retrospective medical review of 11 consecutive patients with lesions seen in 2 departments of otolaryngology in Taiwan.

RESULTS: 12 pigmented nevi, 2 to 12 mm (average, 6.4 mm) in diameter, were excised under otomicroscopy, and the EAC was packed with a temporary Penrose stent. One large lesion developed a postobstructive external auditory canal cholesteatoma (EACC). Histopathologic examination revealed 11 intradermal nevi and 1 compound nevus. There have been no recurrences or stenoses of EACs after 3 months to 17 years (average, 6 years) of follow-up.

CONCLUSION: If a pigmented nevus causes symptoms, especially when it is large enough to obstruct the lumen of the EAC and has the possibility of developing into an EACC, it should be excised.

EBM rating: C-4

Pigmented nevus is the most common skin tumor in humans; however, its occurrence in the external auditory canal (EAC) is uncommon. Relatively little information about this entity has accumulated in the English literature.[1-5] Most of the clinical cases have been reported in the Japanese literature.[6-8] Kobayashi et al[6] reviewed the Japanese literature from 1927 to 1981 and found a total of 35 cases of benign pigmented nevus and 8 malignant melanomas of the EAC. In this paper, we present the clinical experience with a series of 11 consecutive cases of pigmented nevus during an 18-year period.

MATERIALS AND METHODS

From 1986 to 2004, a total of 11 patients (9 women and 2 men) with a pigmented nevus of the EAC were treated by the author at Taipei Medical University Hospital and Chang Gung Memorial Hospital. Their ages ranged from 11 to 59 years, with a mean age of 35 years. The right ear was affected in 4 patients, and the left in 7 patients. This study has been approved by the Institutional Review Board of our hospital. Of the 11 patients, all lesions were photographed using a rigid otoscope or otomicroscope and were photodocumented with color slides. The clinical data is summarized in Table 1. The common clinical features in all cases were frequent itching of the EAC and excessive accumulation of wax with difficulty in cleaning. Three patients were referred from a local medical doctor for evaluation and excision of a tumor of the EAC. Otoscopic examination revealed a discrete brown or black dome-shaped or papillomatous hair-bearing mass at the external meatus of the EAC of the affected ear in 10 of 11 cases. There were accumulations of wax and desquamated keratin found behind these lesions in 6 patients. One patient suffered from an earache and bleeding when cleaning the wax. The lesion was located at the orifice of the inferior wall of EAC and was large enough (12 mm in diameter) to nearly completely obstruct the lumen of the EAC (Fig 1). High-resolution CT of the temporal bone was performed to rule out the possibility of a postobstructive type of external auditory canal cholesteatoma (EACC).[9] On evaluation of the CT images, accumulation of desquamated keratin plugs with bone erosion of adjacent bony floor of the EAC medial to the nevus was confirmed (Fig 2), and a diagnosis of stage II EACC was made.[10] Correct preoperative diagnosis of pigmented nevus was made for 10 of the 11 patients. One patient was diagnosed preoperatively as having a squamous cell papilloma. No patient complained of hearing impairment. In 10 patients, only a single lesion was found. In 1 patient (case 2), there were 2 nevi found in the posterior wall of the left EAC. All lesions were elliptically excised with some healthy surrounding skin under otomicroscopy. The impacted wax medial to the nevus was carefully removed also.

From the Department of Otolaryngology, Taipei Medical University Hospital, Taipei Medical University.

Reprint requests to: Fei-Peng Lee, MD, Department of Otolaryngology, Taipei Medical University Hospital, 252, Wu-Hsing Street, Taipei, 110, Taiwan.

E-mail address: fplee@tmu.edu.tw.

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Table 1
Summary of 11 patients with pigmented nevus of the EAC

Patient no.	Sex	Age (y)	Side	Location	Size (mm)	Histopathology
1	F	32	R	Inferior	6	Compound nevus
2	F	29	L	Posterior	2	Intradermal nevus
				Posterior	5	Intradermal nevus
3	F	20	R	Posterior	9	Intradermal nevus
4	F	45	L	Anterior	7	Intradermal nevus
5	F	59	L	Superior	3	Intradermal nevus
6	M	11	R	Inferior	12	Intrdermal nevus
7	M	52	L	Anterior	8	Intrdermal nevus
8	F	24	L	Superior	9	Intrdermal nevus
9	F	52	L	Inferior	12	Intradermal nevus
10	F	22	R	Posterior	6	Intradermal nevus
11	F	44	L	Inferior	4	Intradermal nevus

Surgery was performed under local anesthesia for 9 patients and under general anesthesia for 2 patients. In the case associated with EACC, the affected epithelium of the cholesteatoma was excised with the pigmented nevus, and underlying irregular erosive bone was saucerized with a diamond burr to achieve a smooth surface. After careful hemostasis, the skin defect of the EAC was packed with gelfoam and a rolled silastic Penrose drain as a stent for 2 weeks (Fig 3).

RESULTS

A total of 12 pigmented nevi were excised. The size of these nevi ranged from 2 mm to 12 mm in diameter, with an average of 6.4 mm. Histopathologic examination revealed 11 intradermal nevi (Fig 4) and 1 compound nevus (Fig 5). All patients had an uneventful postoperative course. The wound of the EAC, including the case associated with EACC, developed good regrowth of the epithelium about 3 weeks postoperatively. All the presenting symptoms were relieved, and there have been no recurrences or stenoses of the EACs during the follow-up of 3 months to 17 years (average, 6 years).

Figure 1 Otoscopic view showing the pigmented nevus on the inferior wall of the external meatus of the left EAC (case #9).

DISCUSSION

Pigmented nevus is a collection of groups of melanocytic nevus cells located in the epidermal, dermal, and, rarely, subcutaneous tissue. Other names include nevomelanocytic nevus, pigmented mole, common mole, and melanocytic nevus. The pigmented nevus can be classified according to the site of the clusters of nevus cells.[7,11] A collection of nevomelanocytes in the epidermis can be classified as a junctional nevomelanocytic nevus, in the dermis as intradermal nevus, and in both areas as a compound nevus, because the nevus evolved by a process of nevus cells from the epidermis " dropping down" into the dermis.[11,12] Nevi in adults are primarily of the intradermal type, and nevi in children are primarily of the junctional type. In this series,

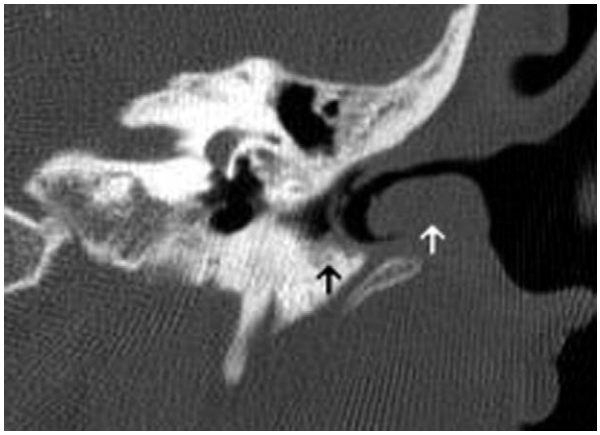

Figure 2 Coronary view of high-resolution CT of the temporal bone revealed irregular erosive bony surface of the inferior wall of the EAC (*black arrowhead*). Accumulation of wax and desquamated keratin plugs medial to the pigmented nevus (*white arrowhead*) were also noted.

Figure 3 A rolled silastic sheet forming a Penrose drain was packed into the external ear canal as a stent.

10 of 11 nevi were intradermal type and 1 was a compound nevus. Of the 35 patients with benign nevomelanocytic nevi in the EAC that were reviewed by Kobayashi et al,[6] 8 were men and 27 women. The age distribution was 7 patients younger than 19 years, 5 between 20 and 30 years, 8 between 30 and 39 years, 9 between 40 and 50 years, and 6 older than 50 years. In the present series of 11 patients, 9 were women and 2 were men, with a ratio predominance of women of about 4.5 to 1. Although most nevi on the body surface are acquired during the second and third decades of life,[11] the age distribution of pigmented nevus of the EAC in this series revealed only 1 child and 10 adults, with most of the cases ranging between third and sixth decades of life.

The clinical manifestations of pigmented nevus of the EAC have been reported to include ear fullness, foreign body sensation, hearing impairment, and otalgia,[5-7] but some cases were asymptomatic and were found incidentally. In the present series, the most common symptom was difficulty in cleaning out the wax. One patient complained of an earache and bleeding when cleaning out the wax, but this lesion was associated with EACC.

The size of pigmented nevi of the EAC has been reported to range from half the size of a small bean to 4 × 2.5 cm.[11]

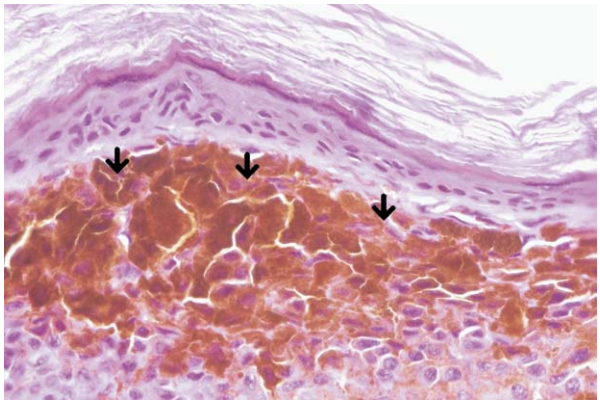

Figure 4 Histopathologic examination of intradermal nevus showing nests of nevus cells (*black arrowheads*) in the dermis (case #9, hematoxylin-eosin stain).

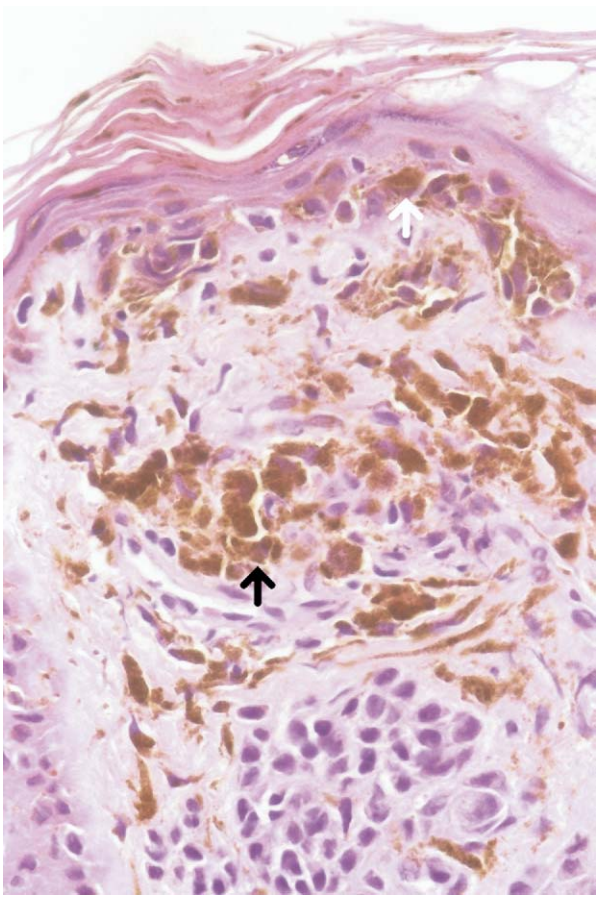

Figure 5 Histopathological examination of compound nevus showing nests of nevus cells in the epidermis (*white arrowhead*) and dermis (*black arrowhead*). (Case #1, hematoxylin-eosin stain).

In the present series, the size of the 12 excised nevi ranged from 2 mm to 12 mm in diameter.

Vrabec and Chaljub[9] defined the etiology of EACC as congenital, posttraumatic, iatrogenic, spontaneous, postinflammatory, and postobstructive. The postobstructive-type EACC was defined as EACC occurring secondary to a lesion, such as osteoma, fibrous dysplasia, or a foreign body, that occludes the external meatus.[9] In the present series, although there were 2 lesions that were 12 mm in diameter and their size was big enough to occlude most of the lumen of the EAC, only the lesion originating in the 52-year-old woman developed into EACC (case 9); the lesion originating in the 11-year-old child did not develop into EACC. Comparing the 2 patients, the former was 40 years older than the latter. A possible mechanism of development of the EACC is that the migration function of EAC epithelium, especially that of the inferior wall, is impaired after long-term obstruction by the large inferior-based pigmented nevus. To our knowledge, this is the first case report of an intradermal nevus causing a secondary EACC. In this case, high-resolution CT of the temporal bone was arranged to confirm the diagnosis and extent of EACC. With high-resolution temporal bone CT examination, EACC is most

commonly seen as a soft-tissue mass in the EAC with associated bone erosion and intramural bone fragments.[13]

In 2005, Naim et al[10] classified the EACC into 4 stages based on the histopathology and clinical symptoms of EACC: stage I with hyperplasia of the canal epithelium, stage II including periosteitis, stage III including a defective bony canal, and stage IV showing an erosion of adjacent anatomic structures. In the present case, the extent of EACC was stage II, and it was successfully treated with excision of the obstructed nevus and saucerization of the eroded bony wall of the EACC. We recommend that such cases be treated as soon as possible to prevent progression to more advanced-staged EACC.

The gross appearance of pigmented nevi in the body is varied and can be classified into morphologic categories including flat, slight elevated, halos, verrucoid, polypoid, dome-shaped, and sessile, papillomatous.[12] In 10 of the 11 cases in this series, otoscopic examination revealed a discrete brown or black dome-shaped or papillomatous hair-bearing mass at the external meatus of the EAC; correct diagnosis of pigmented nevus was easily made preoperatively. However, commonly acquired nevi vary considerably in their gross appearance.[1,12] They may present as a gray papillomatous mass or a pink spherical mass without hair on the surface;[2] in these cases, correct diagnosis cannot be made until excision and pathological examination are done. Kazikdas et al[5] recommended that to rule out melanoma, all melanocytic nevi should be excised instead of biopsied. The possibility of a benign pigmented nevus should be included in the differential diagnosis when evaluating a lesion in the EAC.[5] Otherwise, differential diagnosis of the pigmented nevus of the EAC should include seborrheic keratosis, senile keratosis, pigmented actinic keratosis, benign pigmented keratosis, common warts, pigmented fibrous histiocytoma, squamous papilloma, blue nevus, atypical nevus, malignant melanoma, and other malignant lesions such as squamous cell carcinoma.[1,11,14] Malignant melanoma has been known to arise in association with a nevus.[15] However, the risk of transformation of any single melanocytic nevi into cutaneous melanoma is very low.[16] Although malignant melanoma of the EAC has been reported,[17-19] there has been no evidence of this melanoma transforming from a preexisting pigmented nevus in the EAC.

The treatment of choice of a symptomatic pigmented nevus in the EAC is complete excision, and there has been no recurrence reported in the literature. Complete removal of nevi is best accomplished by elliptical excision. Destructive modes of therapy including electrodesiccation, cryotherapy, dermabrasion, and laser treatment should be considered very carefully if used in the management of pigmented nevi, especially regarding lesions located in the EAC. They have the definite disadvantage of not providing tissue for histopathology. Laser treatment of melanocytic and nevomelanocytic lesions has the theoretical risk of malignant transformation.[11] However, this benign lesion may be observed and only excised when it causes symptoms or develops asymmetric border irregularities/changes, color variations/changes, or the sudden increase in diameter.[16,20] The skin defect after surgical excision has been repaired with a free full-thickness skin graft taken from the inner surface of the thigh or postauricular area,[6-8] or allowed to granulate in and heal spontaneously.[1] In this series, the wound after elliptical excision was left exposed; a rolled, sterile Penrose sheet was typically placed into the canal as a stent for 14 days; and resurfacing of the cartilaginous and osseous ear canal was accomplished by spontaneous granulation and healing with satisfactory results.

CONCLUSION

Pigmented nevus of the EAC is an uncommon clinical entity. In this paper we present a series of 11 cases of pigmented nevus in the EAC. The occurrence of this lesion has a definite female predominance with a ratio about 4.5 to1. If a pigmented nevus causes symptoms, especially when it is large enough to obstruct the lumen of the EAC and has the possibility of developing into an EACC, it should be excised.

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